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(54) Transmit diversity in a wireless communication system

(57) A method for transmitting data via multiple antennas by modulating data to be transmitted into a plurality of modulated symbols, encoding each pair of modulated symbols from among said plurality of symbols in accordance with a transmission diversity scheme to result in a plurality of N by N matrices, with each N by N matrix corresponding to each pair of modulated symbols, generating a M by M code matrix comprised of the plurality of N by N matrices, orthogonally spreading the M by M code matrix to generate an output matrix, generating a plurality of row-permuted matrices by exchanging at least one pair of rows in the output matrix, and transmitting the symbols in the plurality of row-permuted matrices via a plurality of antennas by using either a space time transmission diversity scheme, a space frequency transmission diversity scheme, or a combination of a space time transmission diversity scheme and a space frequency transmission diversity scheme.

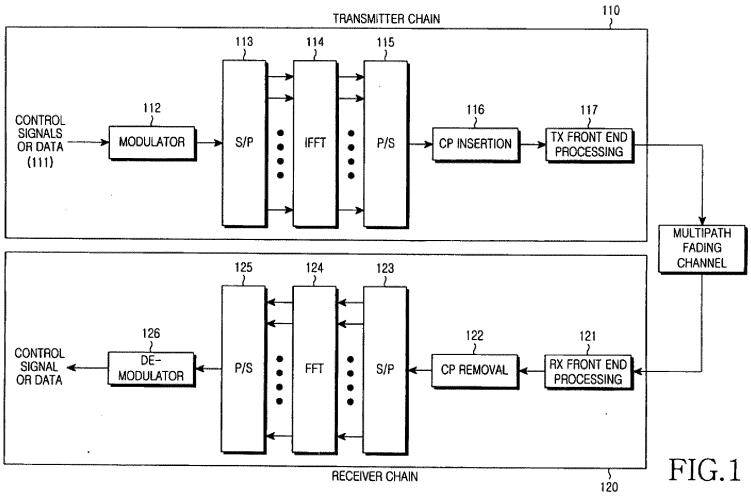

FIG.1

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PARTIAL EUROPEAN SEARCH REPORT

under Rule 62a and/or 63 of the European Patent Convention. This report shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number
EP 14 15 0146

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 2006/093057 A1 (ZHANG JIANZHONG CHARLIE [US] ET AL) 4 May 2006 (2006-05-04) * abstract * * page 4, paragraph 33 - page 8, paragraph 60 * -----	1-16	INV. H04L1/06 H04L1/16 H04L25/03
A	WO 03/056742 A1 (HOTTINEN ARI [FI]; TIRKKONEN OLAV [FI]) 10 July 2003 (2003-07-10) * abstract * * page 9, line 9 - line 21 * -----	1-16	

TECHNICAL FIELDS SEARCHED (IPC)

H04L
H04B

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
The Hague	28 October 2014	Toumpoulidis, T

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04E07)

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INCOMPLETE SEARCH
SHEET C

Application Number
EP 14 15 0146

Claim(s) completely searchable:
-

Claim(s) searched incompletely:
1-16

Reason for the limitation of the search:

A valid embodiment that can be searched is the third embodiment of fig. 10 and matrix equation 28 (searched as an SFBC-FSTD matrix in accordance with the description of page 16, lines 18-25) and which does not take the claimed distribution of reference signals into account since there is no valid basis in the description that combines it in such a way with the claimed invention.

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 15 0146

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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28-10-2014

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82